Interim Report to the
National Oceanic and Atmospheric Administration's
Office of Ocean Exploration
Grant #NA16RP2594
Exploration of Lake Huron's National Marine Sanctuary
January 1 – June 30, 2002

The Institute for Exploration (IFE), in collaboration with the National Oceanic and Atmospheric Administration, is leading an active research program in the Thunder Bay National Marine Sanctuary and Underwater Preserve (TBNMS/UP) to conduct detailed underwater archaeological and geological mapping. The purpose of this long-term program is to discover, document, and provide public access to the unique geological, biological, and cultural resources located throughout TBNMS/UP. In June 2001, IFE carried out a systematic mapping effort in Sanctuary using the multi-frequency side-scan and sub-bottom profiling sonar system ECHO. During this survey more than 50% of the Sanctuary's lake floor was acoustically mapped, covering nearly all of the regions beyond a depth of 15 meters. In addition, a large unexplored region to the north of the sanctuary boundary was surveyed. Fifteen previously known shipwrecks were precisely located using satellite navigation and mapped with high-resolution acoustics. Numerous other targets were imaged that appear to be previously unknown wreck sites; several in particular contain the clear outline of a ship. In addition, a number of submerged limestone sinkholes were discovered and mapped.

January 1 – June 30, 2002

During this period, the Institute for Exploration worked closely with colleagues at the Thunder Bay National Marine Sanctuary and Underwater Preserve (TBNMS/UP) to design and develop the field program, to take place in August/September. In addition, IFE worked with the National Undersea Research Center for the North Atlantic and Great Lakes at the University of Connecticut to help develop the capacity of their research vessel CONNECTICUT to operate the remotely operated vehicle system necessary for the field program. This included helping to design the dynamic positioning system that would enable the ship to maintain an exact fixed position relative to the shipwreck sites being surveyed. IFE also upgraded the imaging systems on the vehicles to high definition quality so that the shipwrecks and other finds could be viewed with the best available technology.

All of the goals were met during this period of preparing for the expedition.

Preliminary report for June 30 – December 1, 2003

In August/September, IFE returned to Thunder Bay. The team used ARGUS, an optical imaging towsled, and LITTLE HERC, a remotely operated vehicle (ROV), to investigate the known shipwrecks and other acoustic targets detected by ECHO the previous year. IFE's exploration team was particularly interested in finding and documenting previously unknown shipwrecks that have been lost in this unusually dangerous region of Lake Huron. IFE also conducted a detailed exploration of the submerged terrain, including

several limestone sinkholes that could contain evidence of early Native American habitation when the lake's shoreline existed at a much lower elevation than today. At times during the last Ice Age, the level of Lake Huron was 120 meters lower than the present level, and the sinkholes now lie inland from the ancient shoreline.

The expedition was very successful. An average of two shipwrecks per day, with a total of 17 shipwrecks in all, were mapped in great detail using LITTLE HERC's high-quality imaging systems. Among this number were two newly discovered shipwrecks, including a 19th century three-masted wooden schooner. More time was spent documenting the more significant shipwrecks in the Sanctuary. By performing this detailed visual survey of the shipwrecks, an archaeological baseline was established to set the stage for more intensive future research.

During the 2002 field program, the ARGUS and LITTLE HERC vehicle systems were also used to search for evidence of human habitation prior to the refilling of the lake as continental ice sheets melted following the last Ice Age. Three of the limestone sinkholes and several other geologic features discovered during the 2001 mapping survey were investigated in detail. One of the sinkholes was particularly interesting as it showed evidence of groundwater venting, creating a distinct fluid layer that differs thermally, chemically, and biologically from the surrounding bottom waters. When this particular sinkhole existed during drier times, above the ancient shoreline, it was probably the site of a small coastal pond attractive to early humans and other mammals that inhabited the region more than 8,000 years ago. IFE proposes to return to this site in 2003 to conduct a detailed sampling effort to learn more about this fascinating site and explore for potential prehistoric archaeological material.

Exploration of Lake Huron's National Marine Sanctuary
Expenditures
January 1 – June 30, 2002

Travel	$338.50
Equipment	$1,170.81
Contractual	$9,636.69
Total Expenditures for reporting period	**$11,146.00**